

CLAIMS

1. Process for the preparation of esters of (meth)acrylic acid by (trans)esterifying (meth)acrylic acid or its ester derivatives with monohydric or polyhydric alcohols in the presence of an acidic (trans)esterification catalyst, wherein said process after the formation of the esters of (meth)acrylic acid further comprises reacting remaining acid groups with one or more component(s), wherein at least one component forms with at least said catalyst an ester compound not having a β -hydroxy group or an amid compound.
- 10 2. Process according to claim 1, wherein said at least one component forms with at least said catalyst an ester compound not having a β -hydroxy group.
3. Process according to any one of claims 1-2, wherein when a β -hydroxy forming component, an amine component, a carbodiimide component or a mixture of two or more thereof is present, said component(s) are added only after the acidic catalyst has been neutralized with said at least one component that forms an ester compound not having a β -hydroxy group or forms an amid compound.
- 15 4. Process according to any one of claims 1-3, wherein said at least one component additionally forms with the remaining free acid groups an ester compound not having a β -hydroxy group or forms an amid compound.
- 20 5. Process according to claim 5, wherein the remaining free acid groups comprise free (meth)acrylic acid groups and free carboxylic acid groups.
6. Process according to any one of claims 1-5, wherein said at least one component is chosen from the group consisting of a cyclic ether, an ortho-ester, an ester, a lactone, an alcohol, a carbonate, an unsaturated component, or a mixture thereof.
- 25 7. Process according to claim 6, wherein said at least one component is selected from the group consisting of an oxetane component or derivative, an ortho-ester component, an alcohol component or a mixture of two or more thereof.
- 30 8. Process according to claim 7, wherein the at least one component is selected from the group consisting of 3-ethyl-3-hydroxymethyl-oxetane, 3-methyl-3-hydroxymethyl-oxetane, trialkyl ortho formate, trialkyl ortho acetate, and neopentylglycol.
- 35 9. Process according to any one of claims 1-8, wherein a neutralizing system

that comprises said at least one component is added in an amount appropriate to obtain an acid value of the acidic catalyst, AV1, of less than about 2 mg KOH/g of resin.

10. Process according to any one of claims 1-9, wherein a neutralizing system
5 that comprises said at least one component is added in an amount appropriate to obtain an acid value of the free acid excluding the acidic catalyst, AV2, of less than about 20 mg KOH/g of resin.

11. Process according to claim 10, wherein the neutralizing system comprises
10 said at least one component and one or more components selected from the group consisting of a β -hydroxy forming component, an amine component, and a carbodiimide component.

12. Process according to any one of claims 1-11, wherein the neutralizing system is added in an amount of about 300 mol% or less relative to the total amount of acids.

15 13. Process according to any one of claims 1-11, wherein the at least one component is added in an amount of 105 mol% or more relative to the total mol% of acid catalyst.

14. Process according to any one of claims 1-13, wherein the ester of (meth)acrylic acid is a (meth)acrylate functional polyester or polyalkyd.

20 15. Process according to any one of claims 1-14, wherein the acidic catalyst is selected from the group consisting of sulfuric acid, phosphoric acid, and monoesters thereof, para-toluene sulfonic acid, benzene sulfonic acid, styrene sulfonic acid, and methane sulfonic acid.

16. Process for the preparation of an ester of (meth)acrylic acid resin by
25 (trans)esterifying (meth)acrylic acid or its ester derivatives with monohydric or polyhydric alcohols in the presence of an acidic (trans)esterification catalyst, wherein said process after the formation of the esters of (meth)acrylic acid further comprises reacting remaining acid groups with one or more component(s), wherein at least one component is chosen as such
30 that the acid value of the resin does not substantially increase when stored in an open jar in an oven at 80°C for at least 1 day.

17. Ester of (meth)acrylic acid resin obtainable according to the process of any one of claims 1-16, wherein the acid value of the resin does not substantially increase when stored in an open jar in an oven at 80°C for at least 1 day.

35 18. Ester of (meth)acrylic acid resin according to claim 17, wherein the AV1 value of said resin is less than about 2 mg KOH/g of resin.

19. Process for neutralizing an acidic (trans)esterification catalyst in a reaction mixture comprising an ester compound, the process comprising reacting one or more component(s) to said reaction mixture comprising the acidic catalyst, wherein at least one component forms with at least said acidic catalyst an ester compound not having a β -hydroxy group or forms an amid compound.

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20. Process for neutralizing an acidic (trans)esterification catalyst according to claim 16, wherein the at least one component is selected from the group consisting of an oxetane component or derivative, an ortho-ester component, an alcohol component or a mixture of two or more thereof.

10 21. Powder coating composition comprising an ester of (meth)acrylic acid obtained according to the process of any one of claims 1–18 and a photoinitiator or a peroxide.

22. Powder coating composition according to claim 21, wherein the composition comprises a mixture of a crystalline and/or semi-crystalline ester of (meth)acrylic acid with an amorphous ester of (meth)acrylic acid.

15 23. Powder coating composition according to any one of claims 21–22, wherein the composition contains a photoinitiator and is UV-curable.

24. Wet coating composition comprising an ester of (meth)acrylic acid obtained according to the process of any one of claims 1–18 and a photoinitiator or a reactive diluent.

20 25. Composite resin comprising an ester of (meth)acrylic acid obtained according to the process of any one of claims 1–18 and a peroxide or a reactive diluent.